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CARNEGIE

MAGAZINE

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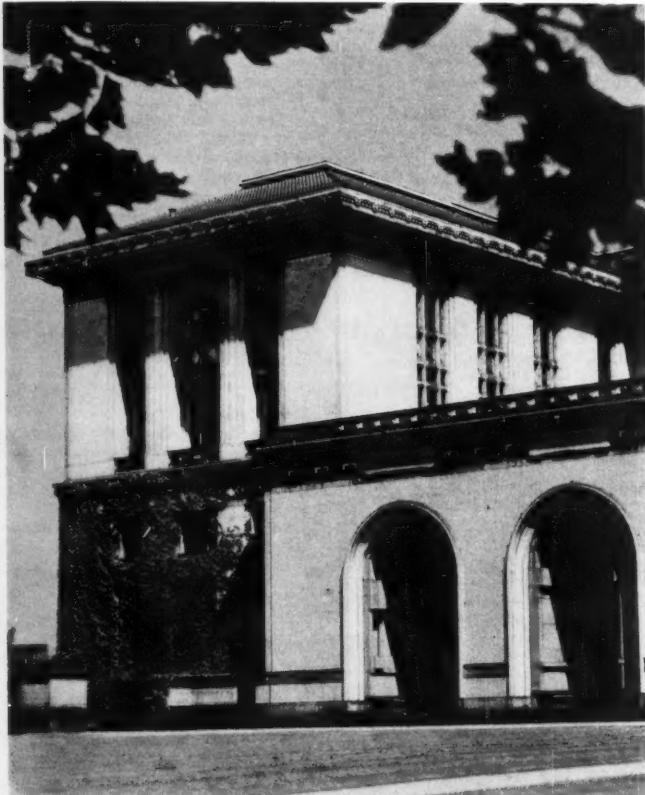
CARNEGIE
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VOLUME X

PITTSBURGH, PA., JUNE 1936

NUMBER 3



A WING OF THE COLLEGE OF FINE ARTS
THE CARNEGIE INSTITUTE OF TECHNOLOGY

(See Page 83)

THE CARNEGIE MAGAZINE

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VOLUME X NUMBER 3

JUNE 1936

No ceremony that to great ones longs,
Not the king's crown nor the deputed sword,
The marshall's truncheon nor the judge's robe,
Become them with one half so good a grace
As mercy does.

—MEASURE FOR MEASURE

•••

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•••

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holds its possessions in trust for mankind and for
the constant welfare and happiness of the race.
Anyone, therefore, who by a gift of beautiful
works of art, or objects of scientific value, or a
donation to its financial resources, aids in the
growth of these collections and the extension of its
service is contributing substantially to the glorious
mission of the Institute.

The Carnegie Institute will be the final home of
every worthy collection of pictures and museum
objects when the men and women who have
chosen them wish to have the world enjoy them.

—ANDREW CARNEGIE

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limit the articles that appear in its pages.

BON JOUR, MR. SLOAN!

At a time when the minds of politicians are running into a hundred wild and chimerical schemes, each one of which is supposed to achieve the perfect solution of the problem of social security, Alfred P. Sloan Jr. wins the confidence of the country with a practical plan that routs and forestalls all these inexperienced and dangerous dreamers. Mr. Sloan has generously accepted the principle that American industry owes its workmen far more than their daily wage. He recognizes it as a moral obligation that the right to do business in this country involves a cost beyond the amount of the pay roll and includes a reasonable provision of funds against unemployment and the incapacity of age. In establishing this comprehensive system of protection in his great General Motors Corporation, he sets an example which industry, the railroads, and all employers in general are delighted to follow, and in doing that he and the large group of noble and benevolent business leaders who are acting in concert with him on this problem are producing a plan that will at once take care of the situation and confound those political leaders who would make such a practical social program impossible by confiscating the financial reserves on which it is based.

KIND WORDS

THE FLORIDA STATE MUSEUM

GAINESVILLE, FLORIDA

DEAR CARNEGIE:

. . . I would like to take this opportunity to congratulate you. I look forward to receiving it, and I find it most stimulating and enjoyable.

—FLORIDE GANTT

DEAR CARNEGIE:

Again it is a pleasure to send my subscription for another year's visits of the Magazine—always printed beautifully, cheerful and happy in its outlook, a credit to Mr. Carnegie's ideals and to the City for which he did so much.

—SOUTHARD HAY

AN ELUSIVE IDENTITY

DEAR CARNEGIE:

Can't you tell us the name of the poor Pittsburgh boy who got his education by reading books in the Carnegie Library and studying art and science in the Carnegie Institute, and then became vice president of the Guaranty Trust Company of New York?

—ADDISON G. SHUMAKER

In answer to this and many similar inquiries, the Editor does not feel free to print the name of the subject of the article in last month's CARNEGIE MAGAZINE, but if friendly curiosity will go so far, a letter directed to the vice president of that bank, at Fifth Avenue and Forty-fourth Street, New York City, might bring the information desired.

TAKING THE FLOOD CURE

BY HAROLD A. THOMAS

*Professor of Civil Engineering and in Charge of Hydraulics Research
Carnegie Institute of Technology*

[The sight that met a horrified Pittsburgh on March 18 came as no surprise to Professor Thomas, who knew the scene in imagination all too well. Its inevitability, he warned, was only a matter of time, yet no ounce of prevention was taken. An outstanding authority in the United States on hydraulic problems, he cannot remember the time when the mysterious ways of water, particularly as it courses through our rivers, have not been of consuming interest to him. He has followed actively the history of many American floods, and his advice has been sought frequently on curative measures. As consulting engineer of the Flood Commission of Pittsburgh since 1928, he has insisted that our only salvation depends on a system of retarding reservoirs, a plan that he helped to devise for Dayton, Ohio, after the deluge there. As a result, flood fears there are forever past. A group of Western Pennsylvanians recently had a Congressional hearing in Washington, and their appeals were so sympathetically received that favorable legislation has now been taken. The Magazine is pleased to present this able scientific treatment of the subject by a member of the Tech staff directly engaged in designing our city's protection.]



Pittsburgh's long-delayed flood-protection program is completed, perhaps its occurrence cannot wholly be counted a misfortune.

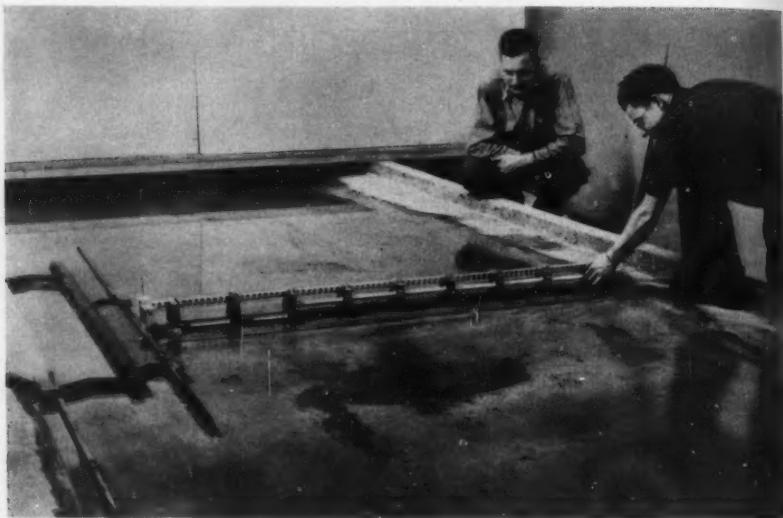
For a quarter of a century, ever since the publication of the Pittsburgh Flood Commission's monumental report of 1911, there has existed detailed and authoritative engineering information in proof of the feasibility of eliminating the flood menace by constructing retarding reservoirs on the Allegheny and Monongahela rivers or their tributaries. If active construction of the reservoirs now terminates the long period of public apathy, the labors of the members of the Commission will not have been in vain.

Because the recent flood was unprecedented, many believe that it is not likely to be repeated. This contention

is fallacious. There is every reason to think that there will be still higher floods in the future. For instance, had the rain that caused the recent flood fallen two weeks earlier—when the ground was still deeply covered with snow—the forty-six foot stage at Pittsburgh would have been materially exceeded.

History proves that great floods tend to recur. Thirty-seven centuries ago the Egyptians carved the record of flood dates and stages on the rocky canyon walls near the Second Cataract of the Nile. Those floods of ancient days achieved the same magnitude that modern engineers have measured when that unruly river has been on rampage today.

To obtain a clear conception of the principle behind the recurrence of floods, consider the fundamental causes of flood-producing storms. These causes arise from the world-wide circulation of winds as a result of the unequal effects of the sun's heat on ocean and continent surfaces. The conflict of opposing winds sets up waves in the earth's atmosphere, much as the conflict of currents in a brook produces ripples on the surface. In the latitude of the United States the atmospheric waves are several hundred miles long and travel from west to east with a speed



TESTING A MODEL OF THE EMSWORTH DAM IN THE HYDRAULICS LABORATORY

New piers and gates to control the level of the Pittsburgh pool are now under construction.

of several hundred miles a day. The existence of the waves is detected by the barometer, the crests being known as "highs" and the troughs as "lows." The earth's atmosphere contains moisture, normally dissolved as a transparent gas but precipitated as clouds or rain when the atmospheric pressure drops. Thus the arrival of a wave having a strong trough of low pressure at a time when the atmosphere is heavily laden with moisture produces heavy rainfall over an extensive area. Sometimes the area of greatest rainfall will coincide with the watershed of a river. Given these conditions, the stage is set for disastrous floods. World-wide in origin, such floods obviously must continue to occur at irregular intervals. People whose homes and places of business are situated on river banks must recognize this fact.

On the rivers of Western Pennsylvania graphic evidence of past superfloods can be found in the existence of flood plains, level terraces extending from the river bank to the steeper valley sides. Such a plain is composed of soil deposited by

floods of former years or ages. This deposition was illustrated during the current flood, when the level terraces bordering the local rivers were covered by a thick layer of mud, which appreciably raised the permanent level of the land. In Pittsburgh and the adjacent region the most valuable industrial and business properties occupy the flood plains of the rivers, and countless residences are similarly situated. The only hope of affording these sites positive and permanent protection from the floods peculiar to their location lies in the creation of major engineering structures.

Five types of engineering structures or works have been used successfully as flood protection in the United States and other parts of the world—namely, levees, flood ways, channel improvements, flood walls, and retarding reservoirs.

In the lower Mississippi Valley effective flood protection has been gained by confining the river between earthen embankments known as "levees," and also by leveeing off definite longitudinal

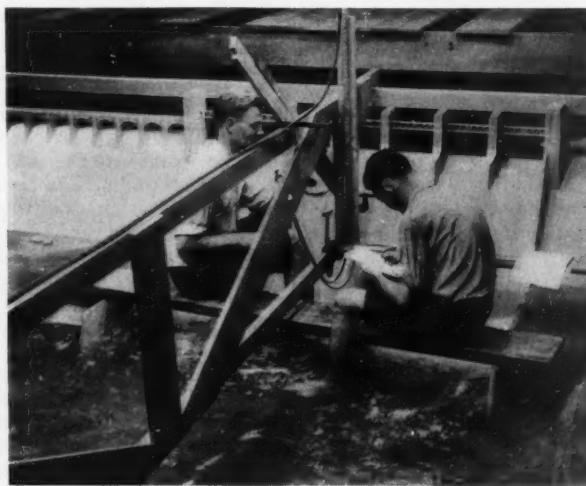
strips of the flood plain to serve as auxiliary channels or "flood ways" to carry off flood flow in excess of the main-channel capacity. Both of these devices require too much land to be practicable for use in the narrow, highly industrialized valleys of Western Pennsylvania.

"Channel improvements" include the straightening, deepening, and widening of the river channel, and the removal of bridge piers and other obstacles to the current. Engineering studies prove that, since the maximum flood crest can be reduced only a foot or two by this means, this method in the Pittsburgh district must be regarded as a secondary rather than a primary control.

The construction of concrete "flood walls" to inclose high-value districts has been applied with satisfactory results in some cities—Portsmouth, Ohio, being a good example. Inasmuch as these walls can protect limited distances only, they are obviously unsuited to Western Pennsylvania, where the industries composing the life source of the communities outline the river front for hundreds of miles. Still another disadvantage presented by the flood wall concerns the danger, remote but not impossible, of a sudden failure of the structure, which might cause untold loss of life. From the point of view of public welfare, therefore, wisdom directs the investment of all available funds in some form of flood control that will provide a more universal protection. These remarks apply only to the use of flood walls as a primary method of protection. If, how-

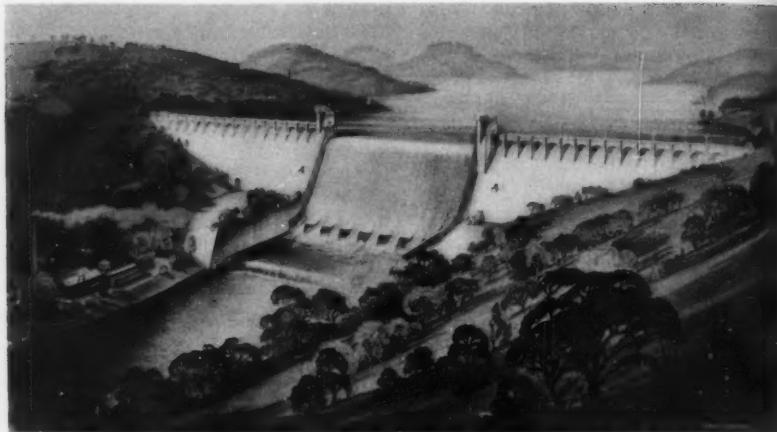
ever, they are used to supplement the protection afforded by reservoirs, there is no reason why these walls should not be constructed to beautify the water front, provide boulevards, and guard low-lying land.

Since four of the known methods of primary flood protection must be rejected because of difficulties inherent to the Pittsburgh district, consideration must be given to the use of retarding reservoirs. Such reservoirs are functioning with notable success in various cities in the United States, of which Dayton, Ohio, is an outstanding instance. A retarding-reservoir system is built by throwing dams across the headwaters or tributaries of a river, each of which creates a basin sufficient in size to store the largest flood that might originate on the stream above its site. The base of each dam is pierced by outlet conduits controlled by valves, which are ordinarily kept wide open to allow the normal flow of the stream to pass through freely. During a flood the valves are closed, and the reservoirs are then filled. The portion of the flood



MODEL OF THE TYGART RIVER DAM

Measuring the velocity of the water at the base of the dam. The crest piers shown here have been eliminated in the final design.



THE TYGART RIVER DAM NOW BEING BUILT—1,850 FEET LONG AND 240 FEET HIGH

The hydraulic design of this concrete dam was executed at Carnegie Tech.

flow that has collected above the dam site is thus subtracted from the burden on the main river and the rise above the danger stage is prevented. When the flood recedes, the valves are reopened to release the impounded waters.

In the reservoirs proposed for Pittsburgh, the method of operation during the spring and summer months would differ somewhat from that just described. In April, after the greatest flood threat is past, the outlet valves of the dams will be closed to permit a certain amount of water to accumulate in the lower part of the reservoirs for stream control during the dry season. Thus the excess supply will insure the maintenance of river navigation during dry periods by providing water for the operation of locks, at the same time reducing the hardness and corrosiveness of the river waters and minimizing the undesirable effects of sewage pollution.

An important advantage of the retarding-reservoir attack lies in the fact that any degree of protection can be secured by constructing additional reservoirs from time to time. The findings of the engineers of the Pittsburgh Flood Commission indicate that it is uneconomical to build enough reservoirs to eliminate the flood damage in its

entirety. The most desirable program, however, provides for a group of reservoirs at a cost of about \$55,000,000—an expenditure that will prevent perhaps four fifths of the destruction.

The famous 1911 report of the Flood Commission of Pittsburgh proposed the construction of seventeen dams on the main streams and tributaries of the Allegheny-Monongahela river system. Since the publication of that report many of the reservoir sites have necessarily been abandoned because they are now occupied by important industries, and United States Army engineers have recommended in several cases the substitution of a single large reservoir for two or more smaller ones. According to those engineers whose experience with the subject gives great weight to their advice, the following very large reservoir sites are at present held to be most desirable—the upper Allegheny River at Warren, Pennsylvania; the Conemaugh River at Saltsburg, Pennsylvania; and the Tygart River at Grafton, West Virginia. Sites for smaller reservoirs include French, Tionesta, Red Bank, Mahoning, and Crooked Creeks, and the West Fork River.

Construction is now in progress on a great concrete dam across the Tygart

THE CARNEGIE MAGAZINE

River, which will be the first of the suggested flood-retarding reservoirs on the Allegheny-Monongahela river system. This \$18,000,000 project was originally intended to represent the Federal Government's contribution toward the control of this river system, but recent Congressional legislation gives promise that the Government will also assume the construction cost of the other reservoirs. The Tygart River Dam, 1,850 feet long and 240 feet high, will be the largest concrete dam east of the Mississippi. Ten great outlet conduits will pierce its base, discharging their jets into an enormous "cushion pool" created by an auxiliary dam below the main barrier.

During the designing of a great dam like the one on the Tygart River various intricate hydraulic problems are always encountered. Within recent years American engineers have rapidly come to recognize that problems involving the flow of water in rivers and over dams can best be solved by experimenting on models. At the Carnegie Institute of Technology the Hydraulics Research Laboratory is fortunate in having the opportunity to take an active part in answering many hydraulic questions that arise in connection with the design of dams built in various parts of the United States. Because it is strategically located at the center of the world's greatest system of river-navigation dams, this laboratory was naturally selected by the United States engineers to conduct numerous tests on models of river-navigation structures. A familiarity with this work at Carnegie over a period of several years has made possible the training of a skillful and experienced staff. The laboratory and its staff have attracted model-testing work from widely separated parts of the country. At the present writing fourteen men—four of them Government resident engineers—are engaged in model-testing, and active tests on eight major models are in progress.

An extensive program of tests on models for the Tygart River Dam, or of

special portions of it, has been carried on in the laboratory during the past three years. Many features of the structure—the notched spillway apron, the cushion-pool dam, and the conduit outlet deflectors, which were designed with painstaking care while the experiments were under way—can now be seen reproduced to enormous scale in concrete as the actual dam begins to take form. In designing a dam as high as the Tygart it is necessary to prevent the overflowing water from scouring out a great hole in the river bed directly below. The difficulty was overcome in an unusual manner by building an auxiliary dam to act as a cushion pool to absorb the impact of the falling water. Another important hydraulic consideration presented by the Tygart-type dam concerns the danger of "cavitation," or vacuum formation in the outlet conduits, which is capable of producing such heavy vibration as to destroy the conduit walls. An investigation of the possibilities of cavitation in the outlet conduits of the Tygart River Dam, the Madden Dam at Panama, and the proposed Bluestone Dam in West Virginia is worked out on models by means of a special apparatus built at Carnegie.

As a project of pure research, much work has been done at Carnegie to develop the technique necessary to the use of hydraulic models in predicting the movements of flood crests in rivers. Such predictions are of vital importance in determining the exact effects of retarding reservoirs in lowering flood heights. Assistance in this research project was obtained from engineers paid from public funds under the Civil Works Administration and the Local Works Division. At the moment, when hopes are bright for the immediate completion of the Allegheny-Monongahela retarding reservoirs, it seems likely that the results of this study will aid materially in securing a well-balanced and economical final design for a system of dams to protect the Pittsburgh district against floods for all future time.

THE ARTIST AND THE COMMUNITY

An Exhibition of Paintings by Pittsburgh Artists

By JOHN O'CONNOR JR.

Assistant Director of Fine Arts, Carnegie Institute



THE Cincinnati Art Museum is celebrating this year the fiftieth anniversary of the dedication of its building. In commemorating the event, the museum is holding a comprehensive exhibition of the work of Frank Duveneck. A review of this exhibition gave Lewis Mumford an opportunity to point out that the relation between the artist and his community, in the case of Duveneck and Cincinnati, was a fortunate, perhaps even an exemplary, one. He explains that if too little of Duveneck's work is known in the East, it is for the happiest reason; his paintings were eagerly purchased by local patrons. Duveneck was recognized as an important personality in his city. He was the chief teacher in its art school, a helpful patron of its museum, and the arbiter of taste as well as the glass of fashion. Mr. Mumford indicates that had there been a dozen Duvenecks in the region in his lifetime, the relation might have been stimulating for both the artist and his community. He concludes his discussion of Duveneck and Cincinnati by pointing out that the fact that the city now has two of the most important smaller collections in the country is an indirect tribute to the fact that it once had a great artist among its citizens and cherished him.

This relation between the artist and his community should exist everywhere. It will make for a saner and more accepted art. There will be no

great chasm between the artist and his community. The artist will understand his city, respect its feelings, and record its life and its aspirations. With a sympathetic and liberal audience, his art will develop and it will confirm rather than conflict with the ideas and ideals of his community. If the occasion should arise where there is a conflict, the community will be in a position to respect and hear the artist's opinion without bitterness, and perhaps be persuaded that his point of view is the right one. One of the encouraging developments of art in this country is the way in which people responded to van Gogh during the recent tour of his paintings in the United States. They accepted van Gogh as a master and discussed his paintings with that as a premise. Too often, people demand that the artist paint subjects that appeal to them and in a manner that finds a response in their sensory centers, instead of attempting to follow the artist with the assurance that he can lead them to a deeper appreciation of the visual aspect of the world and to new sensations through his conception of line, light, color, and space. It is unfortunate that a community should think of the artist as an eccentric who should be left to his own devices; on the other hand, the artist sometimes feels, especially when neglected and ignored, that he is an exceptional and superior person. Then if his talents are not appreciated and recognized, he withdraws into himself and, as a result, produces paintings without meaning to the city around him and accordingly he can find no place in it. A common meeting ground between the artist and his community is necessary so that he may live as becomes his calling and



PICNIC
BY JANE IRWIN DASCHBACH



PITTSBURGH
BY CHARLES TIMOTHY SMITH



FISH MARKET—PECK SLIP
BY EVERETT WARNER

so that his community may trade him food, clothing, shelter, and leisure for his work. The problem of integrating the artist and the community is one that has to be solved for a healthier art and a more gracious civilization.

These thoughts on the relation between the artist and his community have come to mind on the occasion of the third exhibition of paintings by Pittsburgh artists at the Carnegie Institute, which will be on view through July 26. This exhibition has grown in importance and strength. The fact that it is now being held annually and that more and more emphasis is being placed on it by the Institute is one of the many signs of the happier relationship that is coming into existence between the Pittsburgh artist and his townsfolk. There are many other signs. The Federal Government in the national emergency has recognized the place of the artist in the economic life of the

nation and has found ways to employ his services in his own environment. Pittsburgh artists are being invited to important national exhibitions. The artists are cooperating among themselves and are giving their assistance in various civic enterprises. There are many movements under way to establish firmly and securely creative work in this community. The development of the artistic resources of Pittsburgh lies in promoting harmonious relations between the artist and his public.

The first exhibition of paintings by Pittsburgh artists under the auspices of the Carnegie Institute was held in 1932, when eighteen artists were selected "not primarily as the eighteen best Pittsburgh painters in the estimation of the Department of Fine Arts, but as set forth the various aspects of Pittsburgh art." The next exhibition was held last year, when twenty-six artists were represented. This year there are twenty-five,

of whom nine were in neither one of the former exhibitions. This is some indication of the rise of new figures in the art of Pittsburgh. The exhibition was limited this year to artists who live and work in Allegheny County.

This show is an even one. It is varied, fresh, and alive with contemporary scenes, thoughts, and techniques. There are many evidences in it that Pittsburgh artists are keenly aware of and are attuned to what is going on in the world of art. Most of them, very appropriately, find their themes in the community of which they are a part.

Among the newcomers to the exhibition is Charles Timothy Smith, whose name was unknown in his city until he was admitted to the Corcoran Biennial in 1935. He presents two local scenes, "Pittsburgh" and "Liberty and Fifth Avenues after the Snowstorm." They are honest and modest performances, with no attempt at a brilliant achievement. He has captured the feeling and atmosphere of the city with a reserve that is praiseworthy. Alfred H. Bennett, another artist who is included in this exhibition for the

first time, also offers two Pittsburgh scenes. In the first, "Brady Street Bridge," he utilizes the bridge to frame the view of the river and the mills. In "Mrs. R. B. Mellon's Exhibit, Phipps Conservatory" he makes the glass roof serve as an important factor in his design. His painting is simple, straightforward, and unaffected. Robert L. Lepper introduces a unique note with his two still-life canvases, "Crank Shaft" and "Kitchen Table."

Both are novel in color and fascinating in design. It is remarkable what an intriguing composition he has made out of a mechanical object like a crank shaft.

The welcome element of imagination is introduced by Jane Irwin Daschbach in her painting "Picnic." It is satisfying in color and arrangement. Her figure piece, "The Day's Catch," is done in a broad and effective manner. Samuel Filner, with "The Johnson Lynching" and "Her Night Out," introduces two powerful studies, which display his ability in presenting vital forms. The coloration in both paintings is unusual, almost bizarre, but appropriate to the themes.

In two landscapes, "Pennsylvania Hills, Morning," which has a wholesome freshness about it, and "Mountain Landscape," with its wide expanse of countryside, Christian Walter continues to record the glory of his State. Milan Petrovits in his painting, "Landscape," sees Western Pennsylvania in intense and strong colors, while his sympathetic portrait of his mother is in quiet,



KITCHEN TABLE

BY ROBERT L. LEPPER



COLTER STREET, PITTSBURGH
BY RAYMOND S. SIMBOLI

rich tones, as becomes the subject.

Probably the youngest painter in the exhibition is Clarence McWilliams. His two pictures, "Valley Road" and "Summer Landscape," mark a return to a type of romantic paintings, but they are refreshing and highly individual. It will be interesting to watch his development. Virginia Cuthbert delineates a familiar scene on Fifth Avenue entitled "Movie Palace," the background showing a portion of a church and a moving-picture house. It is a grand piece of painting. Carolin McCreary has a more cheerful and varied palette than most of the artists. She exhibits a luxurious flower piece, "Spring Medley," and a figure, "Gilda," ingeniously placed and done with pleasing tones of green. Russell Hyde recalls the depression period with his painting, "Nothing to Do." In the foreground is a single figure, executed with a sense of rhythm, while in the background a group of men around a fire, the river, and the mills beyond take their proper place in the picture. The subject of old houses and the rear of tenements continues to fascinate Pittsburgh artists.

One of these themes, which marks a high point in his painting, is Raymond Simboli's "Colter Street, Pittsburgh." The contrasting colors of the two houses are made to harmonize, and the composition is carried out with exceeding skill. Mr. Simboli also has a still life that offers a fascinating arrangement of objects.

Two canvases by Everett Warner, "Sunlight Patterns" and "Fish Market—Peck Slip," demonstrate his ability as

a painter, as well as his versatility and his adaptability to different types of technique. An excellent sense of design characterizes Leland Knoch's "A Family Affair," while his "Highballing" is a daring and original study of an on-coming locomotive. It is seldom that an artist pays so much attention to the realistic details of a painting, especially the figure, as Roy Hilton does in "Miner," and yet he has made out of it a very simple picture with true artistry. His "Bulldogging" presents an interesting subject, well conceived and developed, with exquisite tonality in which light, pervading the scene, plays an important part.

In "Mattie," Esther Phillips has made a study of a Negro girl, which has definite plastic form and beautiful brown tones. Her "Portrait of Mildred" is frankly constructed and carefully posed. Richard Crist shows one of his Mexican scenes, "The Sierra Madres," a painting of strength and vigor. His second canvas, "Girl at a Dormer Window," is a delightful study of a young woman with an unaffected background.

With the extreme top of a church, a

hill, a few houses, and telegraph poles strung with wires, which seem to bind in the design, Olive Nuhfer organizes a very vivid impression of a section of Pittsburgh. It is a singularly significant painting done with intense directness. The title is "Rain's Interlude." Her second painting, "Zero Afternoon," is a crisp snow scene with frame houses in the background. It has the feel of winter all over its surface. Rose Ann McGary presents two studies of houses, the first entitled "Contrast," in which design plays a leading part, and "Bleak Mansion," an impressive painting depicting a single extraordinary house. Its color and arrangement combine to make a very striking canvas.

Norwood MacGillyvary contributes two delightful canvases, "Landscape" and "Study Hour in Camp." In both, the point of view is looking down from above. They are pleasing in color and design. Louise Pershing has two very strong canvases in the exhibition,

"Extra Ground—Pittsburgh" and "Westward." They are broadly painted, have effective elements of design, and the colors are used to serve the purpose of intensifying and heightening the scenes. Gustave L. Brust is a newcomer to the exhibition. His painting "Spring Gardener" shows a well-posed and constructed figure. The color is limited but adequate. His second canvas, "Winter Night," conveys a vivid impression of a storm. It is painted in a low key. Wilfred Readio continues to go West for his subjects. His canvases "Chalk Cliff" and "Bristol Head" are rugged and at the same time sensitive studies of far western mountain country. Grace Permar's palette in both "Studio Window" and in "Jersey Harbor" is different from that of any other Pittsburgh artist. She sees more delicate and clear colors. Her main interest is in simple design, which she makes to serve her purpose very effectively. Last but not least in the exhibition is a single canvas by Samuel Rosenberg. It is entitled "Springtime on Hope Street." This artist still clings to his local scenes. His canvas is an arresting study of a city street leading along a high railroad embankment. The whole scene recesses properly and displays a fine sense of composition.

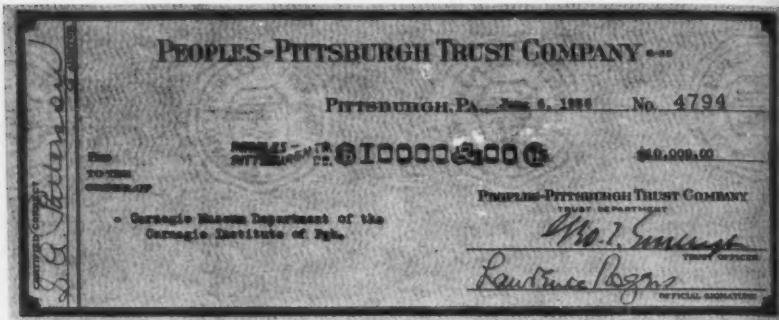
The exhibition gives an excellent cross section of Pittsburgh painting. It has no tremendous high spots in it; on the other hand there are no low points. It is encouraging to know that twenty-five Pittsburgh artists can present paintings that are marked by competency, originality, and sympathetic understanding of contemporary life, and especially of the life of their own community. It would be easy for these painters to be slavish imitators of what has gone before in art, but they are utilizing all the discoveries of the modern masters in their own individual manner. The exhibition is one more step toward that exemplary and ideal condition in which Duveneck found himself in Cincinnati or, perhaps, which he helped to make for himself.



SPRING GARDENER
BY GUSTAVE L. BRUST JR.



THE GARDEN OF GOLD



THIS CHECK TURNED THE TRICK !

THE bequest of \$10,000 made to the Carnegie Institute in the will of Walter B. Scaife was paid in full through the courteous action of Dr. Scaife's executor, the Peoples-Pittsburgh Trust Company, on June 6, as shown above by the photographed check.

This completes the task set before us fifteen years ago when the Carnegie Corporation of New York proposed to pay to the Carnegie Institute on July 1, 1936, as a new endowment \$200,000, provided we would raise a similar amount from our friends; or, if we should fail in receiving the whole sum, they would match any part of that amount dollar for dollar.

Nothing was done immediately, because Mr. Carnegie had passed away only two years before, and his individuality was greater than his creation. But in 1925 Mrs. M. F. Virden, whose daughter was graduating from the Library School, was so much impressed by the growing cultural advantages of the Carnegie Institute that when she learned of this financial arrangement of money doubling itself she was glad to contribute \$1,000. It was the first donation to a great cause. We were on our way, but the progress was very slow.

In April, 1927, the CARNEGIE MAGA-

ZINE was inaugurated, with two main purposes in view, first, to acquaint the people of Pittsburgh, and incidentally the world at large, with the development of Andrew Carnegie's creations here; and, second, to stir the hearts of our friends to aid substantially in that development. The Magazine started its Garden of Gold, at first with Jason—so named by Robert Garland—Jason in search of the golden fleece—Jason the Gardener and Penelope his wife commenting on the fruitage which grew two dollars for each dollar planted for the Institute, and three dollars for each dollar planted for Carnegie Tech. Jason and Penelope have for some years been on a vacation; but gifts of money—large and small—began to come in after the appearance of the first number, and through the nine years of the Magazine's existence no month has failed in its printed report of contributions received.

In the meantime Willis F. McCook proposed to give \$10,000 to the Carnegie Institute for the purchase of paintings, on condition that nine others would make similar subscriptions, payable at the rate of \$1,000 a year, to be used for the purchase of works of art and educational objects. When this

THE CARNEGIE MAGAZINE

was reported to the Carnegie Corporation of New York they promised to duplicate these subscriptions, on July 1, 1936, up to \$150,000. Mr. McCook's noble impulse was quickly followed by others, and the sum specified, \$150,000, has already been exceeded by the subscriptions of our friends.

Reports of all these transactions have quite recently been forwarded to the Carnegie Corporation, and on July 1, 1936, they will pay to the Carnegie Institute the full amount of a new endowment aggregating \$350,000.

These gifts to the endowment fund and to the Patrons Art Fund do not by any means give the measure of this popular support. On the contrary, the quiet missionary work of the CARNEGIE MAGAZINE through these nine years has brought in from month to month a never failing stream of additional contributions for operation purposes, as opposed to endowment funds, amounting to \$333,325.08, which added to the endowment gifts make a total sustaining sum to date of \$554,375.71 from our friends. This statement does not take into account the contributions received in the same period for the Carnegie Institute of Technology, whose settlement date is July 1, 1946, to which we shall renew our attention in the September Magazine.

The work will go on. It must never stop. Already the \$200,000 specified by the Corporation has been exceeded in gifts by something more than five thousand dollars; and the payments made to the Patrons Art Fund exceed the stipulated sum of \$150,000 by thirteen thousand dollars. The beautiful thing about it is that there has been no solicitation; every gift has come voluntarily. Our friends have come into the Institute and said: "Your Garden of Gold is worthy of the fullest cultivation." With their aid the work has expanded. Young and old come into these enchanted halls to feel new inspirations brightening their lives. Children come every day in large or small groups, sometimes from as far away as

Johnstown or Cumberland, always to find themselves received like royal guests. Older people learn here to know the meaning of adult education—the daily absorption of useful knowledge by objective study. Electric chains of sentiment and service bind us to our friends—and they to us. Our work is never finished.

With the addition of this recent bequest of \$10,000 to the sum of \$1,833,779.71 the grand total of money gifts reported in the Magazine in the nine years of its history reaches \$1,843,779.71.

RADIO PROGRAMS

TALES THAT NATURE TELLS

EVERY FRIDAY EVENING AT 8:15 OVER KDKA

JUNE

26—"A Naturalist at Pymatuning," by Reinhold L. Fricke, Preparator in the Section of Education, Carnegie Museum.

JULY

3—"Midsummer Wild Flowers," by O. E. Jennings, Curator of Botany, Carnegie Museum.
10—"Nature Camps," by Miss Jane A. White, Assistant Curator of Education, Carnegie Museum.
17—"Midsummer Work of a Tree," by Dr. Jennings.
24—"Nature Trails," by Harold Howland, Graduate Assistant in Biology, University of Pittsburgh.
31—"Midsummer Mushrooms," by L. K. Henry, Assistant in the Section of Botany, Carnegie Museum.

AUGUST

7—"Reptiles of Deserts," by M. Graham Netting, Curator of Herpetology, Carnegie Museum.
14—"Reptiles of Prairies," by Mr. Netting.
21—"Reptiles of Tropical Forests," by Mr. Netting.
28—"Reptiles of the Water," by Mr. Netting.

SEPTEMBER

4—"Fall Flowers," by Dr. Jennings.
11—"Field Work as a Boy's Hobby," by Charles T. Agostini, Assistant Preparator in the Section of Education, Carnegie Museum.

WAR AND THE COMMON PEOPLE

The common people in all nations are more convinced than ever that war is their worst enemy.

—CHURCH PEACE UNION

THE GIANT APATOSAURUS

The Largest Land Animal That Ever Walked the Earth

BY CHARLES W. GILMORE

Curator of Vertebrate Paleontology, United States National Museum

[Mr. Gilmore, recognized in the learned world as a paleontologist of high authority, has won particular distinction by his contributions to the knowledge of extinct reptiles. Before occupying his present position in Washington, he was associated with the scientific staff of the Carnegie Museum, taking part in the earlier field explorations conducted by the Museum under the direction of W. J. Holland. It was the wish of Dr. Holland, who named and described the most spectacular fossil find in the region now known as Dinosaur National Monument, to see a comprehensive illustrated treatise appear on *Apatosaurus louisae*. Although this project was not accomplished in his lifetime, the Museum has had the good fortune to avail itself of the services and erudition of Mr. Gilmore whose monograph on the subject has appeared in the most recent volume of its memoirs.]



THE term dinosaur (terrible lizard) is applied to a group of extinct reptiles whose petrified remains are found on all continents. Nowhere, however, are they more abundant or in a better state of preservation than those occurring in North America. Although all of these animals disappeared from the face of the earth millions of years before man existed, it has been possible to learn from their fossilized remains how they looked in life, what they ate, where they made their homes, and in some instances how they died.

In the popular conception of it a dinosaur is pictured as a lizard of great bulk with a long neck and tail. While it is entirely true that there were dinosaurs conforming to such a description, others no larger than a chicken have been discovered; and between these two extremes there were many more of intermediate sizes.

Of the giant dinosaurs those most familiar to our visitors are the Diplodocus and the Apatosaurus, which stand side by side in the Hall of Paleontology of the Carnegie Museum. Not so well known, perhaps, because

the Diplodocus was discovered first, the Apatosaurus which is more than seventy-six feet long, is the larger of the two, the only creature now in existence comparable with it in size being the sulphur-bottom whale. The mounted Apatosaurus skeleton is one of four on exhibition in the United States—the American Museum of Natural History, the Peabody Museum at Yale, and the Field Museum each containing a representative.

A study of the members of the dinosaur family brings to light more points of disparity than of likeness. The extremes that their forms took are best visualized by contrasting a four-legged dinosaur such as the Apatosaurus with one like the Trachodon (the duck bill), whose fore limbs were so weak and small that it was forced to walk almost entirely upon its strongly developed hind legs. An examination of dinosaur bones shows that one head was disproportionately small and another was exceptionally large. Some were big and cumbersome of frame; others so closely resembled birds in the lightness and grace of their skeletal structure that only the skilled anatomist is able to distinguish between them. Some, like the smooth-skinned reptile under discussion, had to rely upon their immense size to awe their enemies, while others were encased in a protective armor, their hides strengthened by bony reinforcements. Thus the unbroken curve

THE CARNEGIE MAGAZINE

of the *Apatosaurus*' silhouette has no similarity with the bizarre outline created by the projecting plates and spines of kindred types.

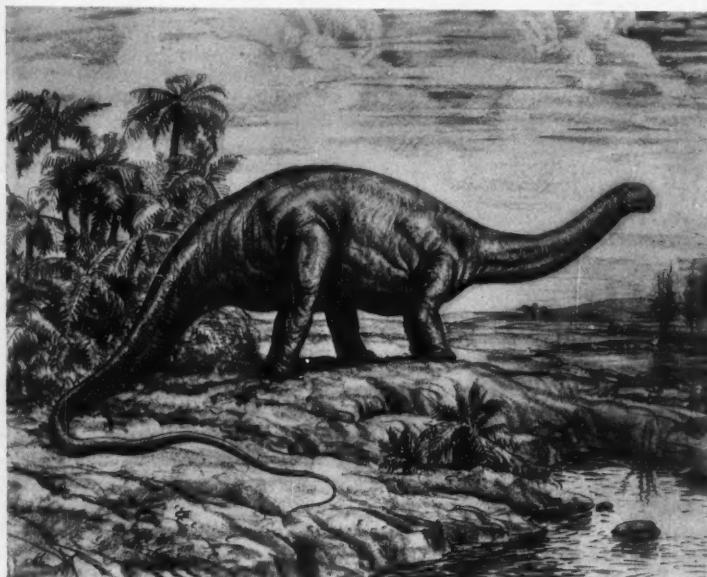
In choice of diet there were the same widely separated differences—some eating flesh exclusively, others feeding entirely upon plants. The *Apatosaurus* was a plant-eater, because its spoon-shaped teeth were adapted only for the cropping of herbage. The absence of masticating teeth indicates that it was obliged to swallow its food whole.

Widely divergent views are held concerning the habits of *Apatosaurus* and its allies—*Diplodocus*, *Camarasaurus*, *Haplocanthosaurus*, and *Brachysaurus*, the principal American forms—but the theory advanced by Sir Richard Owen more than seventy-five years ago has been widely accepted by present-day paleontologists. According to his belief these reptiles, in mode of living not unlike the modern hippopotamus, spent the greater part of their time wad-

ing about in the shallow bayous and sluggish streams, their mammoth legs completely immersed. While they fed upon the aquatic vegetation, which was thought to have grown in abundance in the prevailing semitropical climate, the great weight of their bodies was buoyed up by the water.

The first dinosaurs appeared in the Triassic geological period about a hundred and ninety million years ago. The race was in existence throughout the Jurassic and reached its highest development in the Cretaceous, becoming extinct at the close of that period, giving them a life span of nearly a hundred million years. It is estimated that the Cretaceous period ended at least fifty million years ago.

The Carnegie Museum has the distinction of possessing one of the most extensive collections of sauropodous dinosaur remains ever assembled in a single institution. In number of articulated skeletons and general excellence of preservation, the group is unrivaled.



LIFE RESTORATION OF APATOSAURUS LOUISAE HOLLAND

Drawn by A. Avinoff, Director of the Carnegie Museum

THE CARNEGIE MAGAZINE

Students of the subject will be gratified to learn that in planning to make this dinosaurian collection of the greatest scientific service, the Museum intends to prepare a series of monographic studies dealing with the more important forms. I was asked to write the first of these—"Osteology of Apatosaurus with Special Reference to Specimens in the Carnegie Museum"—which has now been published. This article appearing in Volume XI of the Memoirs of the Carnegie Museum gives for the first time a complete and detailed account of the bone structure of Apatosaurus. It is based on a skeleton from the Dinosaur National Monument in northeastern Utah—a specimen mounted for exhibition more than twenty years ago and today still stands as the most complete example of its kind that has ever been unearthed.

Following the introduction a full history of the discovery and development of the famous quarry in Utah is given. This seems peculiarly appropriate since the Apatosaurus skeleton was the first specimen found there and might be said to have directly stimulated the later excavations of this world-renowned deposit of fossil remains. For thirteen years without interruption collecting was carried on there by Carnegie Museum parties under the direction of the late Earl Douglass, and during that period 700,000 pounds of materials were shipped to Pittsburgh. The quarry map, reproduced for the first time, graphically portrays the richness of this quarry in articulated as well as in disarticulated specimens. Its operation is perhaps the most extensive one ever conducted by an institution in search of dinosaurian remains.

The geology of the region surrounding the quarry is briefly discussed and a complete geological section is given. This is followed by a short review of the position of the various segments of the Apatosaurus skeleton as they were found in the quarry.

The specific account of the individual bones of the skeleton is largely a techni-

cal description and comparison, and therefore of interest only to the specialist. The text is fully illustrated with pen-and-ink drawings of the bones in all aspects. In addition there are fourteen large plates and a frontispiece, a life restoration of the Apatosaurus depicting it as it probably looked in its natural environment. This restoration embodies all the newly discovered structural peculiarities. Special mention should be made of the upward arcuation of the tail as it leaves the body as well as the inclusion of a long whip-lash extremity, both features revealed for the first time in such a restoration.

Except for the frontispiece all the illustrations, comprising some four hundred separate drawings, were made by the well-known paleontological artist, Sydney Prentice, which insures their accuracy and accounts for the excellence of their technical execution.

In a preliminary article published in the Annals of the Carnegie Museum in 1915, the late W. J. Holland designated this skeleton as the type of the new species *Apatosaurus louisae* in honor of Mrs. Andrew Carnegie. It is fitting that this later and more intensive study of the type specimen, which confirms the correctness of Dr. Holland's original determination and contributes to a more complete characterization of the species, should be dedicated to his memory.

After the description of *Apatosaurus louisae* there follows a detailed discussion of a different species, *Apatosaurus excelsus*, a Wyoming skeleton also mounted in the Museum. It furnishes much supplemental information on the osteology of this genus. In the concluding chapters the two species are contrasted and their distinguishing characteristics are set forth. Seldom does an author have an opportunity to work with such complete examples of these large dinosaurian reptiles. It is the author's hope that this manuscript may serve for many years to come as the standard reference on the osteology of the genus.

OPPORTUNITIES BEFORE THE CARNEGIE INSTITUTE OF TECHNOLOGY

By ROBERT ERNEST DOHERTY

President of the Carnegie Institute of Technology

THE twenty-ninth commencement exercises in the history of the school were held in Syria Mosque on the morning of June 8, when 587 degrees and certificates were awarded. President Doherty was introduced to his audience by Samuel Harden Church, Chairman of the Board of Trustees.

MR. CHURCH: Commencement exercises are the milestones of our educational progress. We travel through these school courses from year to year, finding them always interesting and absorbing to us all, and of surpassing importance to those students to whom they signify a special equipment of scholarship and a preparation for life work; but they are in the larger view uneventful until we come upon something that looms big before us and makes an epoch in our history.

We are meeting with such an episode today in presenting a new president of the Carnegie Institute of Technology.

This school has already closed two periods of great works planned and achieved by two great leaders of education. The first period, the period of creation, was given to Arthur Hamerschlag, and with the approbation of Andrew Carnegie and the constructive cooperation of the Board of Trustees the school came into an ordered existence upon a plan and scope so broad and so liberal that we have not yet absorbed

its ideal boundaries. The second period was given to Thomas S. Baker and was marked by a deepening of the fountains of knowledge and the growth of the fame of the school based upon its human output, than which there can be no truer measure of value. Dr. Baker was stricken while working in this rich field of achievement, like a laborer so engrossed in his task that he fails to note the danger of the noonday sun. I rejoice to be able to say that Dr. Baker's belated rest is working wonders and that we all grasp eagerly at the expectant hope for his recovery.

Today opens the third period of this school, and we are now to have a new captain on the bridge. Robert Ernest Doherty was born in Clay City, Illinois, on January 22, 1885, and was gradu-

ated from the University of Illinois in 1909. Upon leaving college he was employed by the General Electric Company as a student engineer, making rapid progress in the work assigned to him until in 1918 he was chosen by the General Electric's great scientist, Dr. Steinmetz, as his assistant. Hungry for further technical instruction he completed a course in graduate work at Union College, and was then appointed consulting engineer in that company, once more under the inspiring direction of the great wizard. In 1925 he organized an advanced course for General



ROBERT ERNEST DOHERTY

THE CARNEGIE MAGAZINE

Electric student workmen; and it was in that task that he became aware of a twilight zone between the knowledge acquired by the student at the moment of his graduation and the knowledge required of him before he could be accepted in industry as a master workman. Appointed professor of electrical engineering at Yale in 1931, he carried this discovery with him, and upon his promotion to the post of dean of Yale's school of engineering, and with the cordial approval of President Angell, he amended the whole course of instruction so as to take up this slack and turn the student out prepared immediately to do efficient and constructive work in the applied science of electricity. In 1934 the Society for the Promotion of Engineering Education, representing all the standard colleges, chose him as chairman of its committee on objectives and length of curriculum.

Such is the man and such his work. Is it any wonder, then, that when the Trustees of the Carnegie Institute of Technology found it incumbent upon them to find a new president, their choice should go with one accord upon this teacher, this engineer, this scientist, this pupil and successor of Steinmetz, and that they should ask you to join with them in extending to him a welcome into the noble company of Pittsburgh educators?

I have the honor to introduce Dr. Doherty, President of the Carnegie Institute of Technology:

PRESIDENT DOHERTY: You are not ordinarily obliged to endure a speech by the President on commencement day, and it is highly improbable that such a burden will be placed upon you again. But this year, by the circumstance of my recent appointment, the plan has been so drawn; and I need not tell you that from my point of view the occasion is a very pleasant privilege.

A year or so ago my family drove through Pittsburgh when the conditions that established the tradition of the Smoky City existed in full measure.

As we reached the highlands and looked back upon that shroud of smoky mist which covered the valley, I heard someone say: "I am thankful we do not live there." Now that very city becomes our home! We have found, however, even in our short time here that there is a much more significant aspect of the city's character than smoke; it is the extraordinary friendliness of its people. There are few things in life to be treasured more highly than that; and if that is what goes with smoke, then we like smoke.

But my growing enthusiasm for this great pivotal center of industrial America does not rest on that aspect alone. The mammoth enterprises of which the smoky mist is a symbol; the courage and constructive imagination of the men who have made these enterprises possible; the spirit of welcome and attitude of helpfulness of the industrial and business leaders toward the development of the Carnegie Institute of Technology; the warmth of interest shown in the fine arts, and the growing distinction of the city as a center of cultivation of these sources of intellectual and esthetic enjoyment; the fine spirit and serious purpose pervading our student body—these are the clear facts which stir my enthusiasm and give me a feeling of confidence and optimism regarding the future. So we come to Pittsburgh with high esteem for the city as a home, and I am thrilled with the great opportunities for constructive service which lie before my colleagues and me.

On this first opportunity to speak publicly in Pittsburgh it seems appropriate that I should review and interpret the fundamental relationships, as I see them, of the Carnegie Institute of Technology both to greater Pittsburgh and to the nation; and, in the light of these relationships and of the obligations on our part which they imply, attempt to define our major educational problem.

Our institution, located at the civic center of a great metropolis and also at

THE CARNEGIE MAGAZINE

the very heart of industrial America, is founded upon the resources and wisdom of a distinguished pioneer and benefactor whose wish was to promote the education of young men and women and to foster the development of technology, art, and domestic science. Thus the institution has inherently some basic relationships that it is our duty to recognize. We are under obligation to contribute our best, along with other institutions, to serve the intellectual and artistic needs of the community; also to provide facilities for higher learning which will accomplish three major purposes. One of these purposes is to prepare graduates for professional service in the highest sense in both technology and the fine arts, and thus to assure to the community leaders for the future who will help to sustain both the dominant industrial position Pittsburgh has enjoyed in the past and the growing distinction of the city as a center of art. The second purpose is to provide a suitable education for those capable young men and women whose inclinations or natural gifts may not be along highly professional lines, but who are eager to prepare themselves for useful lives or the enjoyment of artistic or intellectual pursuits. And, finally, it must be our purpose to contribute our due share to new knowledge—to the results or research on which the progress of industry and business fundamentally depends. Thus, by the circumstances of our location and founding, our general aim is to integrate the activities of the Carnegie Institute of Technology with the intellectual, scientific, and artistic growth of the Pittsburgh area.

But our obligation to this area is also, in one sense at least, our obligation to the nation. Pittsburgh is not an isolated, self-sufficient unit of society; it depends upon the nation and the nation depends upon it. Consequently, in order to deserve and maintain our national position, our institution must be of genuine service to the educational and scientific needs of the

country, particularly in those technological matters upon which our vital relationship to it depends.

Now, naturally these general purposes to which, it seems to me, we are inherently committed, have been essentially those that have characterized the fundamental policy of the institution. There is no clearer indication of this than the well-known distinctions achieved in these very directions by the students and faculty during the administration of my honorable predecessor, Thomas Stockham Baker. A few instances that have only recently come to public attention may be mentioned. The broadcasts of music and the drama by the students of the College of Fine Arts have gained both local and national recognition for the institution. Moreover, national distinction has come to a practically independent student enterprise. The Carnegie Tartan has been selected by the Associated Collegiate Press as the best college weekly in the country. The Carnegie Reserve Officers Training Corps unit has continued to achieve leading positions in national and regional competitions, and graduates of the Department of Architecture have won coveted fellowships in state and national contests. Student achievements such as these do not merely happen; they issue only from an atmosphere of encouragement and cultivation created by the faculty; they are the fruits of genuine education. In addition, the scientific contributions by the staff, notably in the fields of coal, metals, hydraulics, mechanics, chemistry, and physics, have unmistakably identified the Carnegie Institute of Technology, nationally and internationally, as a real force in the development of science and engineering. All of these monuments of accomplishment which have risen above the surface in clear view serve only to indicate the less evident, yet very real, foundation that has been laid during the years past for sound education and research along the general lines I have mentioned.

This is not to say, however, that our task of educational development is completed. It is never completed. Each generation brings its own new problems to the educational institution. I have referred to three general purposes which should characterize our programs in higher education, and naturally there will be new problems in connection with all of these. However, among those facing us at the present time there is one which transcends all others and I therefore wish to discuss it especially; it is the problem of liberalizing and deepening our educational programs in technology in order that our graduates may be better prepared to meet the responsibilities of their generation.

Our civilization is characterized by rapid, undirected change. We are living in a kaleidoscopic, technological world in which we are being whisked at an ever increasing tempo from a simple to a complex society—from an aggregation of social units which formerly were comparatively immobile, isolated, and self-sufficient, to a highly mechanized system of mobile, intercommunicative, and interdependent ones. I need not burden you with a detailed account, such as you have read and heard many times, of the extremely rapid growth of science and technology during the last two generations; the great engineering accomplishments which have provided conveniences and comforts of life, but which in so doing have completely transformed and complicated our environment; the intense specialization of the engineer's activity and his disregard of the social consequences of his work; the failure of social sciences to keep abreast of changes and provide a rational basis for social growth and development; and the consequent state of precarious equilibrium in which we now find ourselves. Suffice it to say that these rapid changes of environment which have allowed no time for organic readjustment have given rise to centrifugal forces that are stressing the very fiber of our social and economic structure and confounding the minds

that are trying to understand them. We are driving down a winding, branching, technological highway, with the accelerator pressed to the floor and with conflicting hands grabbing at the wheel. We skid at the curves, the car creaks, and we become panicky. As the road branches we become confused, yet we must go on. But, alas, when we reach a long stretch of straight road down grade we are all thrilled again and forget that there are more curves and more branches ahead. So far we have survived this high-speed, aimless journey, but at some future curve our car may burst under the strain of excessive centrifugal forces or skid off the highway, or in our confusion and conflict at the branch of the road we may crash. These dismal possibilities will become more and more probable unless we learn to settle upon a rational purpose and to control ourselves and the growing power in our hands.

We must learn to do these things. We must learn how to preserve in the new and complex world the fundamentals of freedom on which our nation was founded. We must learn more definitely to what end we are developing so rapidly, and how to plan rationally an approach to that end. In other words, the hope of the future, as it has been in the past, lies in education. But education itself must not be looked upon as a static thing; it also must evolve. Our problem is not merely to give more people more education; it is rather to give more people the right kind of education; and the right kind changes with the generations. We are thus not primarily concerned with those educational needs which characterized the first decade or two of this century, or even of the present; we are concerned with the needs of the future; we are educating young people for service in the next generation and must, therefore, keep our eyes focused on that end. In this decisive race between the growing complexity of our man-made environment and our ability to learn how to control it; in this race between

the widening range of products of the minds of one group and the capacity of all of us intelligently to absorb those products; in this race, in other words, between technology and general education, education has been the loser. It is vital that the lost ground be now regained, and those of us who are directly responsible for education must set ourselves to this long, difficult task.

What is the nature of that task? How can we now tell what kind of education will be most appropriate for life and service fifteen or twenty years hence? As one peers into the future there seem to be at least two things we can count upon: one is that the growth and accomplishments of science and technology will continue apace—indeed they have only begun; the other, that the social and economic structure founded upon that growth will become still more complex. If this is a fair assumption, then it seems clear that technological education bears a singular responsibility. It has to cultivate minds that will not only maintain and carry forward the scientific aspects of engineering activity but also understand and help solve the complex social and economic problems that accompany the advances of engineering. I am not proposing that the engineering profession should be the chosen people exclusive of others to lead the world from darkness to light, but I am proposing that its members should take a much more active part in this, and that they are in an indefensible position when they disregard, as they have in the past, the social consequences of their work, leaving these for others to worry about. The results of the latter policy, which are evident on all sides of us, are certainly not auspicious. Engineers are accustomed to planning rationally in matters involving the physical sciences; they must now extend their understanding, interest, and planning to embrace those matters relating to the social sciences. They must as a profession become more than tech-

nicians, applied scientists, and managers of efficient industrial operations. They must become broadly educated men as well, and it is our task to help the new generation cultivate themselves to this end.

Broad education, however, means more in our task than numerous courses in numerous subjects. There is a sharp distinction to be drawn between the usual conception of educational breadth and what we are considering here. In the usual conception it seems to be purely a question of subject-matter content in the curriculum. If the engineering curriculum is too narrow, then, in that view, the way to broaden it is to add or substitute some humanities and social science. I have no doubt that such substitution could be made to great advantage in many engineering curricula. But learning subject matter is only the first third of the educational job; there are two other thirds, equally important. Herbert Spencer said, "When a man's knowledge is not in order, the more of it he has, the greater will be his confusion." Thus the second third is organizing the several subject matters into a significant orderly mental pattern, which is the basis of rational understanding. And finally, the most difficult third is cultivating the student's ability to apply his acquired knowledge in a constructive way to the understanding and solution of new or unexpected situations. It is in the latter two thirds that the usual engineering programs are wholly inadequate, as judged with reference to the educational demands of the new day to which I have referred. We want as many as possible of our graduates to have, when they leave us, a genuine grasp of fundamental science; we want them to have a historical perspective of the social, economic, and institutional developments of the past; to have an organized view, in other words, of the major routes by which, as a people, we have come to be what and where we are; to have acquired the habit of constructive, scientific

thought, which is the distinguishing characteristic of the engineering mind; to have cultivated the ability to organize their thoughts for clear, logical expression; and to have learned to give and take, and thus to cooperate in group activity. We want them to have learned how to learn. These are the intellectual attainments which characterize the foundation for the broad education to which I have referred, and it is our major educational problem to help the students construct that foundation.

In reviewing the basic relationships of our institution and the opportunities that lie before it, we have found among the problems which face us the pressing necessity of recognizing in our educational plan the demands that will be placed upon our graduates during the next generation. We have considered in some detail the character of those demands and the nature of the intel-

lectual attainments regarded as essential to meet them. It is my studied conviction that this institution will not meet its clear obligation if it does not recognize this demand of the future for a deeper and broader education of engineers, and we must pledge ourselves to that end. Moreover, there is one important aspect of this whole matter that has especial significance to those of you graduates who are now about to go out into professional life. It is that the broad education to which I have referred cannot be consummated in college; it can only be started there; it must be completed during professional life. And I hope that if you forget all else I have said, you will at least remember that I have urged you to continue your study, increase your general reading, take an active part in the affairs of your community and an intelligent interest in the problems of your country.

"NATURE'S INFINITE BOOK"

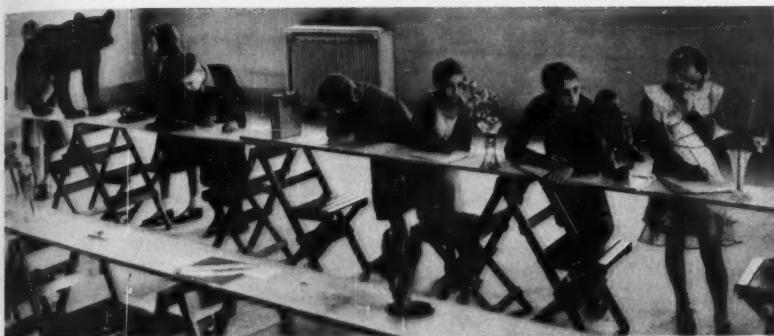
AMERE hundred years ago the teaching of arithmetic as a prescribed subject was received with extreme reluctance, if not downright distrust. English grammar suffered a similar struggle against skepticism. Other rudimentary subjects that are equally important today as basic requirements once experienced the same history, being branded as preposterous notions and disturbers of the educational peace.

Reflections such as these are heartening to the educator who is convinced of the indispensability of nature study in all our schools. Still a pioneer subject, it was first given formal recognition in educational programs a little more than twenty years ago. Although an appreciation of its value has grown rapidly, its acceptance is far from universal. Many schools make no provision for its inclusion in their standard curriculum, while others are still treating it inadequately.

We in Pittsburgh have reason to be proud that the progressive methods and the forward-looking leaders in our local schools have taken full cognizance of the essential character of nature study as a contribution to the mental enrichment of the American child.

Supplementing the study courses in the elementary and secondary schools, the Carnegie Institute, which in its Museum contains a treasure house of natural history inspiration, makes available all its facilities and encourages the extension of this branch of knowledge by lending exhibition material, by conducting classes scheduled daily throughout the year within the building, and by sponsoring projects from time to time.

Last month a special activity, worked out in cooperation with the Biology Section of the Western Pennsylvania Educational Association, took the form of a nature contest on May 16, when



SCHOOL CHILDREN COMPETE IN IDENTIFYING NATURAL HISTORY SPECIMENS

boys and girls of both high- and grade-school ages participated in a competition based on the identification of natural history specimens on view in the Carnegie Museum. The classifications included fungi, ferns, flowers, trees, grains, weeds, vines, insects, fishes, salamanders, toads, frogs, turtles, snakes, birds, animals, eggs, and stones, all of which had been chosen from study lists carefully correlated with their regular school work. Correct spelling, as well as accuracy in knowing the specimens, was required. The contestants were divided into two sections, and the test for the younger group was both shorter and simpler. Initiated three years ago, this contest has become an annual event and is being imitated in other centers.

The Institute lends its support to any idea that has for its goal the advancement of interest in nature study. As an institution dedicated to the sharing of knowledge with all, it is vitally concerned with its spread and its deeper interpretation. This willingness to serve emanates from a deep-grounded belief in the underlying implications that extend far beyond the classroom or museum hall. These two educational agencies working together can provide the child merely with the vocabulary he must have to be able to read with intelligence "Nature's infinite book of secrecy." Once introduced to this book, the last page of which can never be

written, the child will read on and on, seeking in the parks and the wilds for the living answers. These answers, in turn, will lure him on to further investigation, and so is developed a companionship with and love for the outdoors that time and toil can never displace. As his mind grows more mature, he will sense, functioning immutably beneath these manifestations, great natural laws that may well be pondered—laws to be respected, laws not to be defied. The relentless consequences that follow upon the waste and destruction of Nature's resources and the manifold rewards that result from husbanding and protecting them cannot fail to point an obligation to the reasoning mind. Here is a moral education that finds an immediate parallel in life, and thus a better citizen is built.

At every bend of a garden path or twist of a creek lessons directly applicable to contemporary living can be observed—Nature's economies and her bounty, her orderliness and her perseverance—but perhaps the most significant of all in its value to a racing, overstimulated civilization is the example that it presents of abiding tranquillity. In our unrelaxing age of artificial pleasures and clashing tensions, the calm, the humility, and the poise that Nature transfers to those who are equipped to comprehend her sustaining forces may provide the necessary balance.



"THE PLAY'S THE THING"

A Review of John Van Druten's "The Distaff Side"

BY HELEN ST. PETER

THE season in the Carnegie Little Theater was brought to a close at the end of May with the presentation of "The Distaff Side," a comedy of women written by John Van Druten. This English playwright has especial interest for the Drama School because he was well liked by both students and faculty when he lectured in Pittsburgh, and in 1931 his play "After All"—dedicated to his friends Henzie and E. Martin Browne, who were then members of the faculty—was given its première at the school before it reached Broadway.

In writing about "The Distaff Side," Walter Prichard Eaton said: "John Van Druten seems to be a born dramatist. In this play he gives the impression of doing little more than setting a number of assorted people, mostly females, on the stage and letting them talk. A story wanders in and gets itself told, somehow. And when it's all over, you know the people, you like most of them very much, and your faith is restored in the sanity of some of the old virtues and the general decency of the human race, you have smiled often, and generally enjoyed yourself. And it all looks so easy! Well, it isn't!"

Since Roland Millward, the medical student, seems to be the "stand-in" for the author in this play, we are led to believe that Van Druten looked upon the various types of women who make up his mother's family with feelings

composed of admiration, amusement, and annoyance. Throughout the play it is a man's opinion of women that is presented.

Dedicated simply "To my mother," this drama may be considered a tribute to the type of woman represented by Roland Millward's mother, or Evie, as she is called by her three sisters, who have met in her home to celebrate their mother's seventy-fifth birthday. Evie is the born home-maker, who takes pleasure in attending to the comforts of others; she keeps the routine of her household moving smoothly; she gives her worn clothes to one sister and nurses her daughter's lover back to health when he becomes ill; she assists her restless sister Liz in solving her tangled marital problems, and shows her interest in wider problems by reading the books recommended by the other. It would be easier to explain such a woman if she were less inarticulate, but in that case she would be less true to life. Only when her daughter confesses that she is at a loss when confronted by a choice between wealth and love does her mother attempt to put into words her attitude toward life. But the audience is left with the impression that the girl's decision is based rather upon the example of her mother than upon her actual words.

Evie explains that real happiness in marriage can be experienced only with one chosen man, and only then if the woman is content to submerge her own personal life entirely in that of the husband's; and that after the husband dies life is practically over for the wife. The daughter, who has taken to experimenting with the theories of the post-War "Designs for Living," rebels at first, but in the end decides that her

mother is right. The rôle of Mrs. Millward was given a refreshing interpretation by the same student who played the rôle of Lady Britomart Undershift in "Major Barbara."

The sisters are so highly individualized that they are constantly clashing in opinion, except with Evie. One of them has not married, but has found satisfaction in a vaguely sketched career. She is a mystery to Roland, and indeed to the author, but at least she is the only one of the sisters who does not express her envy of Evie. One of the other sisters has but a minor part; she is dowdy, overworked, eager for excitement. But the third sister plays a prominent part in the story, and the two students who were double-cast in this rôle made her seem attractive. The first was the bon vivant type, whose scene with her recalcitrant lover was filled with Rabelaisian laughter. The second was the neurotic type, whose swanky costumes made the feminine part of the audience exclaim with pleasure; she was even better than the first in her team work with the cast, especially in the telephone scene.

The grandmother is a sharp-tongued, self-centered person, whom her daughters have gathered to honor rather from a sense of duty than from affection. Creating the illusion of such age was rather an achievement for the two girls in their early twenties who were assigned this rôle: but one wonders if such a complete change of voice is as necessary as these students seem to think.

The grandmother's companion, Miss Spicer, is a "plain, thin, faded but unremittingly cheerful spinster of fifty," who wears unbecoming clothes and a frowsy wig. This unpleasant part was built up into an amusing bit of fooling, and so competent did she become that her last performance was the best of the entire series; without attempting to "steal the show" she attracted attention as long as she was on the stage by her fussiness, her gigglings, and her ludicrous posturings.

The son Roland was particularly well

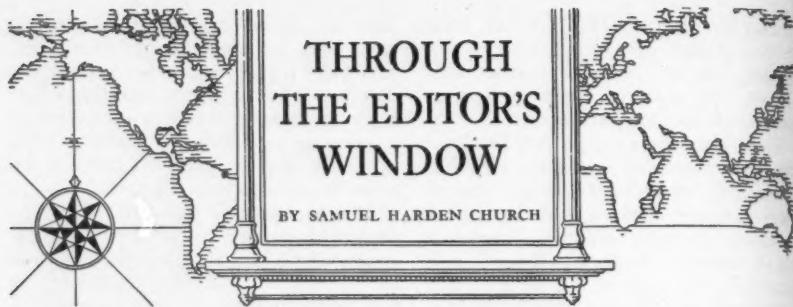
cast; his facial expression was excellent, and his pantomime significant. The two young men who played the daughter's lover had an exacting character to portray; one was successful in suggesting an inferiority complex, the other the highly emotionalized excitement that was appropriate.

The background was the tastefully decorated sitting room of Mrs. Millward, which had an air of spaciousness and serenity. "There is a feeling of fulfillment and completeness about it," said one sister. A mural over the mantel was a warm note of color.

No attempt was made by the director to localize the play in England; intonations, telephone greetings, servants' manners might have belonged to a family of refinement in America, and this prevented the affectation that is sure to creep in when attempts are made to imitate the English diction. Directions in the printed play are flexible, as, for instance, in the following descriptions of costumes: "Mrs. Millward is very nicely, simply but expensively dressed in an afternoon frock; her mother is a bumpy old lady of seventy-five, dressed in black."

As in the other plays of the past season which were directed by Albert Lovejoy, there was a new note which might be called "Accent on Youth." Mr. Lovejoy has the light touch, and his productions leave the impression of unforced gayety. The young actors are very much at home on the stage, and enjoy themselves so thoroughly that the audience, without fully realizing why, begin to enjoy themselves also.

This season reached a new high record of achievement in the history of the Little Theater from the point of view of the audience—especially in the cooperation of the various crafts, the balance of programs, and the choice of plays for intelligent playgoers. Much of the progress has been due to the sound judgment of Elmer Kenyon, whose resignation as head of the Drama Department is deeply regretted by devotees of the theater in Pittsburgh.



BEN GREET AND SHAKESPEARE

BEN GREET is dead, and with his death comes the fear that something of the tradition of acting handed down to us from the time of Shakespeare may pass away. Once when he was giving "The Tempest" out of doors in the Adirondacks, he said to me after the performance that he had missed the approval of his audience. On a suggestion that it was his players and not the audience that were cold, he replied, "All right—I'll give them 'As You Like It' tomorrow in the grand old manner, and see how they take it." Accordingly he keyed his company up to a high pitch wherein every kind of modern reserve was thrown to the winds, and we had a performance so diversified with spirit, and audacity, and laughter, and sighing, and melancholy, and banter, and the tenderness and gayety of love that the audience was enchanted and gave its approval in storms of applause. He was delighted, for approbation was the food of his soul; and when the play was ended he said that he was converted to his original theory that while Shakespeare was, in Garrick's phrase, "not for an age, but for all time," he could only live in his own atmosphere—the atmosphere of realism; and that any effort to conform his majestic language and his significant characterization to modern style would destroy his force.

This was, I believe, the secret of Ben Greet's long and successful career on the

stage. He was not a great actor, and in choosing for himself the rather subordinate parts he made acknowledgment of his own limitations. But he was sincere in the purpose of his acting, that purpose being to recreate each episode and its interpretation just as the poet had portrayed it in his own mind.

Is not this the secret of Shakespeare's success or failure on the modern stage? Grand opera, with its infantile and absurd plots, would never hold the attention of an intelligent audience in thrall today but for the grand manner of sincerity and verisimilitude in which it is presented. When Lucia of Lammermoor advances to the front of the stage and sings her nightingale song, she must make us believe that she is mad or we should laugh her to scorn. When we go to the opera we go into a new and mystic world. So with Shakespeare. Hamlet clothed in a modern garb and speaking with a modern accent the noblest language that ever flowed from the mind of man is a travesty on a great tragedy. Lear, Romeo, Macbeth, Shylock, Othello—the kings and villains in the historical plays—the adventurers who romp through the comedies—the fairies that flit through the moonlight—each and all of these figures must live in Shakespeare's atmosphere, or die in ours. The great tragedians of forty years ago—Booth, Barrett, McCullough, Barry Sullivan, Irving, Forbes-Robertson, Modjeska, Mary Anderson, Bernhardt—all of whom I have seen—every one of the stars in this galaxy of

THE CARNEGIE MAGAZINE

splendor and genius played their parts in the grand manner which Shakespeare requires; and it was this quality of superb acting, not overdone, and never splitting the ears of the groundlings, but illuminating every passion and emotion of human life that gave the poet his mastery over the mind of the nation and fixed his vocabulary in the common speech.

THE RENTAL OF PICTURES

SOME two years ago an exhibition of American paintings was organized for presentation in the principal cities of Canada, and as the plan covered an aggregate time running into a full year, the artists were given a payment of two per cent as a rental charge, based upon the selling price of each picture. This innovation made a distinct and favorable impression on the minds of some of our American painters, and a movement on their part for the payment of a rental for all paintings that may be shown in any exhibition in the future is now being advocated by them with a good deal of persistent earnestness and sincerity.

There is much to be said in theory on both sides of this question, but when the problem is brought into discussion on the basis of facts it seems hardly practicable to agree with the rental advocates.

The exhibitions that are going on from week to week without cessation throughout the United States give the artist a perpetual show window through which he may acquaint the public with the merits of his work and find a market for its sale. It may perhaps be true that some painters will reach a growth in artistic reputation where they no longer need the facility of these friendly show windows for their further success; but there will never be a time when the young painter will not stand in imperative need of such a privilege.

The danger of the movement will be seen by the recognition of art directors as a group that the rental plan, if adopted, will put an end to numerous

exhibitions in America simply because the available financial resources will not permit them to pay the aggregate cost of these charges, which in the case of the individual painting seems so inconsiderable.

The question should be discussed with real sympathy toward the painters; and with an understanding on their part of the probable results that would follow the adoption of the rental policy. Wisdom and common sense will suggest a proper solution of the problem, restoring the enthusiasm and cooperation that have marked all American exhibitions in the past, and permitting their happy and useful continuance without interruption in the future.

WHY "WARN" JAPAN?

GREAT headlines are appearing in the newspapers telling the world that Secretary of State Hull has "warned" Japan against her encroachments in China as a violation of the open-door agreement existing between all the nations. When that statement has burnt itself into the brain of the American people, the authors who are employed by the newspapers to write a column a day make use of this alleged "warning" to prophesy an early war between Japan and the United States.

There will be no war between those two countries either now or ever, because the people of both nations have grown too wise to risk their civilizations in a foolish strife, which could have no end but mutual murder and destruction. But why, in any event, should we warn Japan? It is of course the duty of the Secretary of State when he believes that our treaty rights have been violated to put the facts before the Japanese Government and ask for their correction. That is what diplomacy is for, and in ninety-nine cases out of a hundred diplomacy succeeds.

But let us suppose that it does not succeed. What then? Shall we attack Japan, or threaten her until she attacks us? No. If Japan should show a vital

THE CARNEGIE MAGAZINE

disregard for our treaty rights in China and should refuse to correct the abuse, it would doubtless be found that she was pursuing a like course of contempt toward all the other nations having similar treaty rights; and the policy that should then be resolved upon would be a joint negotiation on the part of all concerned to bring Japan to a proper sense of justice. If she were recalcitrant then, a stoppage of intercourse and of exchange would place her under an interdict immensely more powerful than those religious interdicts of the Middle Ages which brought destitution to offending peoples. And Japan would come to her senses.

This is all that could happen to nations who have agreed with ourselves to the abolition of war as an instrument of national policy. The ends of justice will be served by these resources of peace far better and more imperiously than by a foolish war, which would injure all concerned beyond reparation in a hundred years. The American Civil War, begun seventy-five years ago, has still left its debts to be paid, and while the bitter hatred which followed that strife for fifty years has almost disappeared, the prejudice, which is a milder form of hatred, survives. The World War still has the world proscribed beyond the precedents of history. Its fracture of social and economic equilibrium cannot be repaired for another century. It is true that marauding dictators still threaten international peace—for bluster is the only way for them to preserve their usurped authority—but even against their minatory outbursts the forces of peace are stronger than the forces of war.

But come what will—in Europe, Asia, or Africa—let it be understood that America, although always adequately armed, will never fight again. When this resolution is understood abroad, it will bring peace with it.

Be ashamed to die until you have won some victory for humanity.

—HORACE MANN

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